DOCUMENT RESUME

ED 287 146 CG 020 275

AUTHOR Lucas, Margaretha S.; Epperson, Douglas L.
TITLE Cluster Analysis of Vocationally Undecided Students: A Replication and Validation.
PUB DATE Aug 86
NOTE 28p.; Paper presented at the Annual Meeting of the American Psychological Association (94th, Washington, DC, August 22-26, 1986).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Career Choice; Cluster Analysis; College Students; *Decision Making; Higher Education; *Individual Differences; *Personality Traits; Reliability; Validity

ABSTRACT

Many studies which have investigated the differences between decided and undecided subjects have assumed homogeneity of both subsets, but results of these studies do not justify such a assumption. This study attempted to identify, multidimensionally, types of vocationally undecided college students. Data on 11 variables from 276 undecided undergraduate students were entered into a cluster analysis. Data from the cluster analysis suggest that the optimal partioning of the data was obtained with a five-cluster solution. Analyses of variance and a chi-square analysis using variables not included in the clustering process provided evidence of the validity of found clusters. To assess the reliability of the clustering process, the total sample was split into two subsamples and a five-cluster solution was imposed on each of the subsamples. The resulting clusters were compared to the clusters of the total sample and to the findings of a former, similar study. These comparisons provide support for the reliability of three of the five clusters. The emergence of these clusters suggests a multidimensional perspective of vocational decidedness with apparent implications for differential treatment. (Author/NB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED287146

Cluster Analysis of Vocationally Undecided Students: A Replication and Validation

Margaretha S. Lucas

University of Maryland

Douglas L. Epperson

Iowa State University

Complete Mailing Address

Margaretha S. Lucas

Shoemaker Hall

University of Maryland

College Park, MD 20742

CG 020275

Running Head: UNDECIDED STUDENTS

Paper presented at the annual meeting of the American Psychological Association, Washington, D.C., August 1986.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Margaretha S. Lucas

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Abstract

This study attempted to identify, multidimensionally, types of vocationally undecided students. Data on 11 variables from 276 undecided undergraduate students was the imput for a cluster analysis. Data from the cluster analysis suggested that the optimal partioning of the data was obtained with a 5-cluster solution. Analyses of variance (ANOVA) and a chi square analysis using variables not included in the clustering process, provided evidence of the validity of found clusters. To assess the reliability of the clustering process, the total sample was split into two subsamples and a 5-cluster solution was imposed on each of the subsamples. The resulting clusters were compared to the clusters of the total sample and to the findings of a former, similar study. These comparisons provided support for the reliability of three of the five clusters. The emergence of these clusters suggests a multidimensional perspective of vocational decidedness with apparent implications for differential treatment.

Cluster Analysis of Vocationally Undecided Students: A Replication and Validation

When Kiesler presented the uniformity myth in 1966 referring to the fact that the field made no distinction between types of clients and types of treatments, he addressed therapy in general. A similar criticism, however, could be raised about research and treatment of vocational clients, and it still can. The sizable number of studies which have investigated the differences between decided and undecided subjects (Ashby, Wall & Osipow, 1966; Baird, 1968, & 1969; Barak, Carney, & Archibald, 1975; Bohn, 1968; Elton & Rose, 1971; Greenhaus & Simon, 1977; Harman, 1973; Holland, Gottfredson & Nafziger, 1975; Holland & Nichols, 1964; Kimes & Troth, 1974; Lunneborg, 1975, 1976; Rose & Elton, 1971; Walsh & Hanle, 1975; Walsh and Lewis, 1972; Hawkins, Bradley & White, 1977) have assumed homogeneity of both subsets, but results of these studies indicate that such an assumption is not justified.

The idea that vocational indecision may not necessarily be a unitary trait received support from a study conducted by Osipow, Carney and Barak (1976). These researchers found four indecision factors in the scale they developed: (1) Lack of structure (2) Perceived External Barriers (3) Approach Approach Conflict (4) Personal Conflict. This factor structure was subsequently

successfully replicated in a sample of graduate students (Hartman, Utz, & Farnum, 1979). Another field study conducted by Holland and Holland (1977) also revealed multiple subtypes of indecision, as did a more recent study by Jones and Chenery (1980). The factors identified in the latter study resembled those which had been detected in the two earlier studies.

A particularly interesting question, which to date has not received much research is whether undecided students can be grouped in terms of personality variables that have been found to be related to vocational indecision, i.e., anxiety, self-exteem, salience of work, etc. Such research would complement aforementioned work on typology by tying types of indecision to a wider range of relevant psychological variables. The literature on undecidedness shows the construct to correlate with a number of psychological variables, including self-esteem (Kishor, 1981; Khan, Alvi, 1983; Resnick, Fauble, Osipow, 1970; Maier & Herman, 1974), locus of control (Kishor, 1981; Lokan & Biggs, 1982; Khan & Alvi, 1983; Gable, Thompson & Glanstein, 1976; McIntire, Drummond & Ryan, 1978; Minnick & Gastright, 1974; Thomas, 1974; MacDonald & Tseng, 1971), work role salience (Super & Nevill, 1984; Greenhause & Sklarew, 1981; Greenhaus, 1971), vocational identity (Holland & Holland, 1977), anxiety (Gripka, 1970; Hawkins, Bradley & White, 1977; Berger-Gross, Kahn, Regan, Weare, 1983; Hall, 1963; Appel, Haak & Witzke, 1970;

Walsh & Lewis, 1972; Kimes & Troth, 1974), career decision making styles (Harren, 1976; Lunneborg, 1978), and identity stage (Erikson, 1959; Marcia, 1965; Dellas and Jernigan, 1981).

In an initial study, exploring the concept of typology using most of these variables, Lucas (1983) found at least three types of undecided students. The more specific purpose of this study was to test the reliability of the types found in the former study and to examine the external validity of found types.

Method

Subjects

A large general sample of college students was sought to obtain a reasonable cross section of this large midwestern university. Students of an introductory psychology course requiring no prerequisites, enrolling students from various academic concentrations seemed to provide such a sample. A total of 515 students participated in the study of whom 274 (148 females and 126 males) were considered vocationally undecided according to scores on a screening instrument specifically designed for this research. Their median age was 23 years, ranging from 17 to 40. Every college in the university was represented in the sample.

Instruments

Students completed a screening instrument that elicited data about their level of occupational decidedness by means of a self-rating on a 7-point scale. Each point on the scale described a step in the decision making process. Subjects responding on the scale

with one ("I have identified few, if any, occupations that are attractive to me") through five (" I have narrowed the range of possible occupations to only a few, but I still do not have a first choice") were viewed as expressing varying degrees of vocational undecidedness. Subjects responding on the scale with six ("I have a first choice in occupations, but I am not completely certain about it") or seven ("have a first choice in occupations and I am confident that it is right for me") have been defined as vocationally decided for this study. Accordingly, data from 241 students rating themselves a six or seven were excluded from analyses, resulting in a final sample of 274 vocationally undecided students. An identical 7-point scale was used to assess major decidedness. Finally, two other 7-point scales measured respectively how comfortable students were with their level of occupational and major decidedness, ranging from "not very comfortable" (1) to "very comfortable (7). A variety of other instruments were administered to the students.

(1) Life Style Inventory (LSI)

Epperson and Zytowski (1980) developed the Life-Style Inventory to measure people's orientations towards work (e.g., "When I get an extra hour unexpectedly, I usually work on some unfinished task"), relationships (e.g., "I write my friends frequently") and leisure activities (e.g., "Not having to do anything at all is my idea of having a good time"). Coefficient alphas reported for males and females combined were .81 for the Relationship

scale, .74 for the Work scale, and .68 for the Leisure scale. Some evidence of validity of the inventory was provided by Lucas (1982). In a study done on honors and nonhonors students of equivalent ability (comparable ACT scores), more honors than nonhonors students were classified as work oriented and fewer as leisure oriented. The fact that in both groups women scored higher on the Relationship Scale than men is additional evidence of scale validity.

(2) Career Salience Questionnaire (CSQ)

The original questionnaire developed by Greenhaus (1971) contains 28 items, covering the relative importance or unimportance of work and career in one's life. It deals with three broad areas: 1) general attitudes toward work (e.g., "Work is one of those necessary evils"), 2) degree of vocationally relevant planning and thought (e.g., "Planning for a specific career is usually not worth the effort"), and 3) the relative importance of work (e.g., "I intend to pursue the job of my choice, even if it cuts deeply into the time I have for my family"). The six item short form was used; Greenhaus and Simon (1977) reported a .83 alpha reliability for this form.

(3) Self-Esteem Scale (SES)

This inventory, developed by Rosenberg (1965), presents positive and negative statements about self.

Validity studies demonstrated a significant relationship between the individual's self-esteem and the likelihood that he/she will appear depressed to others (Rosenberg, 1965). Other studies indicated that each step down the self-esteem scale resulted in a larger proportion of respondents with psychosomatic symptoms (Rosenberg, 1965). A study by Silbert and Tippett (Rosenberg, 1965) reported a test-retest reliability of .85. Reproducibility and scalability were reported as 92% and 72%, respectively (Rosenberg, 1965).

(4) State Trait Anxiety Inventory (STAI)

This is a 40-item self-evaluation questionnaire developed by Spielberger, Gorsuch and Lushene (1968). It is designed to measure trait anxiety, a relatively stable individual difference in anxiety proneness, and state anxiety, a transitory condition. According to Dreger (1978), test-retest reliabilities for the Trait scale ranged between .86 (after 20 days) and .73 (after 104 days). Test-retest correlations for the State scale ranged from .54 (20 days) to .33 (104 days) (Dreger, 1978). The Trait scale correlated very highly with the Manifest Anxiety Scale (.80) and the IPAT anxiety scales (.75).

(5) Internal-External Locus of Control Scale (I-E Scale)

Rotter (1966) defined locus of control as a general reflection of an individual's amount of self-control, the belief that one can regulate one's own behavior. According to Rotter (1966), an internalizer perceives himself to have a high degree of self-control, while an externalizer believes himself to have a lower degree control. Test-retest reliability measures reported by Rotter (1966) and Hersch and Scheibe (1967) for varying samples ranged from .42 to .82. Rotter (1966) reported discriminant validity, indicated by low correlations with measures of intelligence, social desirability and political affiliation.

(6) My Vocational Situation (MVS)

This instrument, developed by Holland, Daiger and Power (1980), identifies problems of vocational identity, lack of information about jobs or training, and environmental and personal barriers. Scale reliabilities (KR 20s) for samples of high school students, college students and workers ranged from .86 to .89 for the Vocational Identity scale, from .39 to .79 for the Occupational Information scale, and from .23 to .65 for the Barriers scale. Validity studies demonstrated that the three MVS scales have small to moderate correlations with age and that people with a clear sense of identity and a small number

of informational needs have a small number and variety of occupational aspirations (Holland et al., 1980).

(7) Career Decision Making Questionnaire (CDMQ)

This questionnaire consists of 60 items and it measures three styles of decision making: Planning, intuitive and dependent, based on Harren's Assessment of Career Decision-Making (ACDM) measure. The CDMQ was developed by Lunneborg (1978) mainly as an evaluative instrument, measuring possible changes in planfulness after interventions. A typical item from the CDMQ that planning people would endorse is: "It is typical of me to have worked out a plan before trying anything new," People who use the intuitive style would endorse the following item: "I think that daydreams are a very constructive way to shape one's future," Dependent people tend to endorse items like "I am used to having someone I respect help me make important decisions." Internal consistency measured by the average correlation of items with the total score ranged from .33 to .45 for high school students (N=717) and from .37 to .46 for college students (N=116) across the style items. Validity studies with college students showed that the Planning scale was positively correlated with measures of major and vocational decisiveness, while the Intuitive scale was uncorrelated

with these measures. The Dependent scale was significantly negatively correlated with the self-ratings of decisiveness (Lunneborg, 1978).

(8) Dellas Identity Status Inventory Occupation (DISI-O)

This 35 item scale is based on the fifth stage of Erikson's psychosocial theory, involving the crisis identity versus identity diffusion. Marcia (1965) developed a semistructured interview to assess four possible identity statuses along the identity/identity diffusion continuum: 1) Achieved, in which persons have experienced crisis and have made relatively firm commitments on their own terms; 2) Moratorium, in which persons are in a current state of crisis, but commitments are vague and lacking; 3) Foreclosed, in which persons have experienced no crisis, yet have made firm commitments generally reflecting the wishes of significant others; and 4) Diffused, in which persons have experienced neither crisis nor commitment.

The DISI-O (Dallas & Jernigan, 1981), an objective easily scored scale, was developed to classify persons in terms of Marcia's identity statuses. Intercorrelations among the same status items ranged as follows: Foreclosed, .70 to .42; Achieved, .74 to .34; Moratorium, .57 to .22; Diffused-Diffused, .69

to .12; Diffused-Luck, .62 to .00. The Foreclosed, Achieved and Moratorium status scale reliability estimates (coefficient alphas) were practically identical; .92, .91 and .84 respectively. For the Diffused-Diffused scale .73 and for the Diffused-Luck scale .64 was found.

To determine validity of the scale, DISI-O results were compared with those of Marcia's (1964) semistructured interview. It was found that the classification of 18 out of 20 subjects agreed with that of the interviewer's classification (Dallas & Jernigan, 1981).

Analyses

A sequence of analyses were planned to separate the data into homogeneous subgroups, and to check the validity and reliability of the process. Therefore, the following steps were taken:

(a) Ward's (1963) minimum variance cluster analysis was the method used to pull out those subjects with common variance and label them a cluster. Scores on the LSI, CSQ, SES, STAI, I-E Scale, and MVS were standardized and entered into the cluster analysis. The method provides an error index based on within group variance at each step of the process, which helps determine which step yields the optimal partitioning of the sample.

(b) It was hypothesized that, if the clustering procedures effectively separated naturally existing groups of undecided

students, one would find significant differences among clusters on other variables relevant to undecidedness. Therefore, Analyses of Variance and a Chi Square Analysis for means of relevant variables not included in the clustering process were applied to found clusters.

(c) To examine the reliability of the clustering process, identical cluster-analyses were performed on two subsamples obtained by splitting the sample in two.

Results

Cluster Analysis

Ward's hierarchical grouping analysis program (Statistical Analysis System, 1982), standardized the data and performed the clustering process. To determine the optimal number of clusters, the error term was examined for marked changes in the slope. The merge from eight into seven clusters produced the first abrupt increase in the error term (from .018 to .024), followed by another relatively large increase at the merge of five into four clusters (from .026 to .029). Since a five group solution is more parsimonious than an eight group solution, it was decided to examine the five cluster solution in more detail. Descriptions of each cluster are presented in Table 1.

Validity of the Clusters

As a way of checking the external validity of this cluster solution a one-way Analysis of Variance (ANOVA) across clusters was performed for the means of the variables not included in the

clustering process: Occupational Decidedness, Occupational Comfort, Major Decidedness, Major Comfort and scores on the CDMQ. No significant difference among the clusters was found on Occupational Decidedness, $F(4, 271)=1.74$, $p=.14$. However, significant differences among the clusters were found on Occupational Comfort, $F=5.46$, $p=.01$, Major Decidedness, $F=7.33$, $p=.01$, Major Comfort, $F=11.79$, $p=.01$, Planfulness, $F=3.38$, $p=.01$, Intuitiveness, $F=3.24$, $p=.01$, Dependency, $F=24.92$, $p=.01$. Scheffe's pairwise comparisons showed that members of Cluster 1 scored high (significantly higher than members of some clusters) on Occupational Comfort, Major Decidedness, Major Comfort and Planfulness. Cluster 3 members' profile is similar to that of Cluster 1, except for their scores on Planfulness, which are not significantly different from members of other clusters. Members of Cluster 2 score high on Dependency, as do members of Cluster 4. Members of Cluster 5 scored high on Intuitiveness and Dependency.

A Chi-square analysis on the scores of the DISI-O showed a significant overall main effect ($\chi^2(12)=41.675$, $p=.01$). Members of Cluster 2 follow most faithfully the expected distribution; most subjects concentrate in the Moratorium category. Both members of Cluster 1 and 3 are found in the Achieved and Moratorium category, while most of Cluster 4 members are Diffused. Slightly more people than expected classify themselves as Diffused in Cluster 5.

Reliability of the Clusters

To examine the reliability of the clustering process, the sample was randomly divided into two subsamples (n=142 and n=133). Ward's hierarchical grouping analysis performed the clustering process separately for each of the two subsamples. The clusters in each of the two subsamples were compared to the clusters obtained in the total sample and to the clusters found in the former, similar study by the same author (Lucas, 1983). Three out of five clusters were replicated three times, and two clusters were replicated once. Figure 1 shows the profiles of the three clusters that were most clearly replicated, with those of matching subsamples.

Discussion

The results of the analyses provided some evidence for three reasonably reliable clusters of vocationally undecided students.

Cluster 1 (n=59, 18 males and 42 females) members seem to be well-adjusted psychologically compared to the overall sample, witness their high scores on Self-Esteem, Vocational Identity, and Barriers, and their low scores on both anxiety scales and Externality. The validity studies show that these people are relatively close to deciding on a major, are comfortable with that kind of progress, and make career decisions in a planful, independent way. Most members are found in the Moratorium phase or Achieved phase of Erikson's identity/identity diffusion continuum,

indicating an active involvement in exploring career alternatives or a readiness to commitment.

Cluster 2 (n=68, 28 males and 39 females) members score average on most of the personality scales used in the clustering procedure, except on the Occupational Information Scale, on which they score low, indicating a need for such information. The validity studies show a low level of comfort about the level of decidedness on a major and a dependency in decision making. Most are in the Moratorium phase identity status, meaning they are working on making a decision, but have not yet made up their minds. The low score on Occupational Information may reflect a reason for not making a decision.

Cluster 4 members (n=84, 38 males, 46 females) show a personality almost the opposite of Cluster 1 members. A profile of high scores on both State and Trait Anxiety and low scores on Self-Esteem, a lacking of clear vocational goals, the perception of obstacles in the pursuit of such goals are affirmed by the validity studies. They show, for example, that these students are not very close to deciding on a major, which makes them feel uncomfortable. They also are more dependent in their decision making than members of three other clusters. No Cluster 4 members are Achieved; most are in the Moratorium or Diffused phase, meaning that some are dealing with career issues, but not all, and that none are close

to making a commitment. All of this may be anxiety provoking, as shown in the cluster profile.

Since the validation data seems to fit intuitively the personality profiles found in the cluster analysis, and since all three of these clusters have been replicated three times (once in another sample), this research suggests that these three types of undecided students exist in real life. Experimental hypotheses should be developed and differential treatment strategies attempted.

References

Appel, V. H., Haak, R. A., & Witzke, D. B. (1970). Factors associated with indecision about collegiate major and career choice. Proceedings of the 78th Annual Convention of the American Psychological Association, 5, 667-668. (Summary)

Ashby, J. D., Wall, H. W., & Osipow, S. H. (1966). Vocational certainty and indecision in college freshmen. Personnel and Guidance Journal, 44, 1037-1041.

Baird, L. L. (1968. The indecision scale: A reinterpretation. Journal of Counseling Psychology, 15, 174-179.

Baird, L. L. (1969). The undecided student - how different is he? Personnel and Guidance Journal, 47, 429-434.

Barak, S., Carney, C. G., & Archibald, R. D. (1975). The relationship between vocational information seeking and educational and vocational undecidedness. Journal of Vocational Behavior, 7, 149-159.

Bohn, M. J. (1968). Vocational indecision and interest development in college freshmen. Journal of College Student Personnel, 9, 393-396.

Berger-Gross, V., Kahn, M. W., & Weare, C. R. (1983). The role of anxiety in the career decision making of liberal arts students. Journal of Vocational Behavior, 22, 312-323.

Dellas, M., & Jernigan, L. P. (1981). Development of an objective instrument to measure identity status in terms of occupation crisis and commitment. Educational and Psychological Measurement, 41, 1039-1050.

Elton, C. F., & Rose, H. A. (1971). A longitudinal study of the vocationally undecided male student. Journal of Vocational Behavior, 1, 85-92.

Epperson, D. L., & Zytowski, D. (1980). Life Style Inventory. Department of Psychology, Iowa State University.

Erikson, E. H. (1959). Identity and the life cycle. Psychological Issues, 1, No. 1.

Gable, R. K., Thompson, D. L., & Glanstein, P. J. (1976). Perceptions of personal control and conformity of vocational choice as correlates of vocational development. Journal of Vocational Behavior, 8, 259-267.

Greenhaus, J. H. (1971). An investigation of the role of career salience in vocational behavior. Journal of Vocational Behavior, 1, 209-216.

Greenhaus, J. H., & Simon, W. E. (1977). Career salience, work values and vocational indecision. Journal of Vocational Behavior, 10, 101-110.

Greenhaus, J. H., & Sklarew, N. D. (1981). Some sources and consequences of career exploration. Journal of Vocational Behavior, 18, 1-12.

Gripka, F. (1970). Relationships among inconsistent personality patterns, anxiety and vocational uncertainty in client and non-client populations. Unpublished master's thesis, Southern Illinois University - Carbondale.

Hall, D. W. (1963). A study of the interrelationships among manifest anxiety, vocational choice certainty, and choice behavior. Unpublished manuscript, University of Iowa.

Harman, R. L. (1973). Students who lack vocational identity. Vocational Guidance Quarterly, 21, 169-173.

Harren, V. A. (1976). Assessment of Career Decision-Making. Carbondale: Southern Illinois University, Department of Psychology.

Hartman, B. W., Utz, P. W., & Farnum, S. O. (1979). Examining the reliability and validity of an adapted scale of educational-vocational undecidedness in a sample of graduate students. Journal of Vocational Behavior, 15, 224-230.

Hawkins, J. G., Bradley, R. W., & White, G. W. (1977). Anxiety and the process of deciding about a major and vocation. Journal of Counseling Psychology, 24, 398-403.

Hersch, P. D., & Scheibe, K. E. (1967). On the reliability and validity of internal-external control as a personality dimension. Journal of Consulting Psychology, 31, 609-614.

Holland, J. L., Daiger, D. C., & Power, P. G. (1980). My vocational situation. Palo Alto, CA: Consulting Psychologists Press.

Holland, J. L., Gottfredson, G. D., & Nafziger, D. H. (1975). Testing the validity of some theoretical signs of vocational decision-making ability. Journal of Counseling Psychology, 22, 411-422.

Holland, J. L., & Holland, J. E. (1977). Vocational indecision: More evidence and more speculation. Journal of Counseling Psychology, 24, 404-414.

Holland, J. L., & Nichols, R. C. (1964). The development and validation of an indecision scale: The natural history of a problem in basic research. Journal of Counseling Psychology, 11, 27-34.

Jones, L. K., Chenery, M. F. (1980). Multiple subtypes among vocationally undecided college students: A model and assessment instrument. Journal of Counseling Psychology, 27, 469-477.

Khan, S. B., & Alvi, S. A. (1983). Educational social, and psychological correlates of vocational maturity. Journal of Vocational Behavior, 22, 357-364.

Kimes, H., & Troth, W. (1974). Relationship of trait anxiety to career decisiveness. Journal of Counseling Psychology, 21, 277-280.

Kishor, N., (1981). The effect of self-esteem and locus of control in career decision making of adolescents in Fiji. Journal of Vocational Behavior, 19, 227-232.

Lucas, M. S. (1982). Comparison of life-style orientations of honors and nonhonors students: A construct validation of the Life Style Inventory. Department of Psychology, Iowa State University.

Lucas, M. S. (1983). Personality characteristics of undecided students. Department of Psychology, Iowa State University.

Lokan, J. J., & Biggs, J. B. (1982). Student characteristics and motivational and process factors in relation to styles of career development. Journal of Vocational Behavior, 21, 1-16.

Lunneborg, P. W. (1975). Interest differentiation in high school and vocational indecision in college. Journal of Vocational Behavior, 7, 297-303.

Lunneborg, P. W. (1976). Vocational indecision in college graduates. Journal of Counseling Psychology, 23, 197-205.

Lunneborg, P. W. (1978). Sex and career decision making styles. Journal of Counseling Psychology, 25, 299-305.

MacDonald, A. P., Jr., & Tseng, M. S. (1973). Dimensions of internal versus external control revisited: Toward the development of a measurement of generalized expectancy. Unpublished paper, West Virginia University, 1971, as cited in Robinson, J. P., & Shaver, P. R. Measures of Social Psychological Attitudes. Ann Arbor: University of Michigan Institute for Social Research.

Maier, D., & Harman, A. (1974). The relationship of vocational decidedness and satisfaction with dogmatism and self-esteem. Journal of Vocational Behavior, 5, 95-102.

Marcia, J. E. (1965). Determination and construct validity of ego identity status (Doctoral dissertation, Ohio State University, 1964). Dissertation Abstracts, 25, 6763 (University Microfilms No. 65-5606).

Minnich, W. K., & Gastright, J. F. (1974). Control of environment, acceptance of responsibility for choice, and planning orientation in relation to career information. Paper presented at American Educational Research Association Annual Meeting, Chicago.

Osipow, S. H., Carney, C. G., & Barak, A. (1976). A scale of educational-vocational undecidedness: A typological approach. Journal of Vocational Behavior, 9, 233-243.

Resnick, H., Fauble, M., & Osipow, S. (1970). Vocational crystallization and self-esteem in college students. Journal of Counseling Psychology, 17, 465-467.

Rose, H. A., & Elton, C. F. (1971). Attrition and the vocationally undecided student. Journal of Vocational Behavior, 1, 99-103.

Rosenberg, M. (1965). Society and the adolescent self-image. Princeton, N.J.: Princeton University Press.

Rotter, J. B. (1966). Generalized expectancies for internal versus external locus of control of reinforcement. Psychological Monographs, 80, (I, Whole No. 609).

Spielberger, C. D., Gorsuch, R. L., & Lushene, R. (1968). State-trait anxiety inventory. Palo Alto, CA: Consulting Psychologists Press.

Super, D. E., & Nevill, D. D. (1984). Work role salience as a determinant of career maturity in high school students. Journal of Vocational Behavior, 25, 30-44.

Thomas, H. B. (1974). The effects of sex, occupational choice, and career development responsibility on the career maturity of ninth graders. Paper presented at American Educational Research Association Annual Meeting, Chicago.

Walsh, W. B., & Hanle, N. A. (1975). Consistent occupational preferences, vocational maturity and academic achievement. Journal of Vocational Behavior, 7, 89-97.

Walsh, W. B., & Lewis, R. O. (1972). Consistent, inconsistent, and undecided career preferences and personality. Journal of Vocational Behavior, 2, 309-316.

Ward, J. H. (1963). Hierarchial grouping to optimize an objective function. Journal of the American Statistical Association, 58, 236-244.

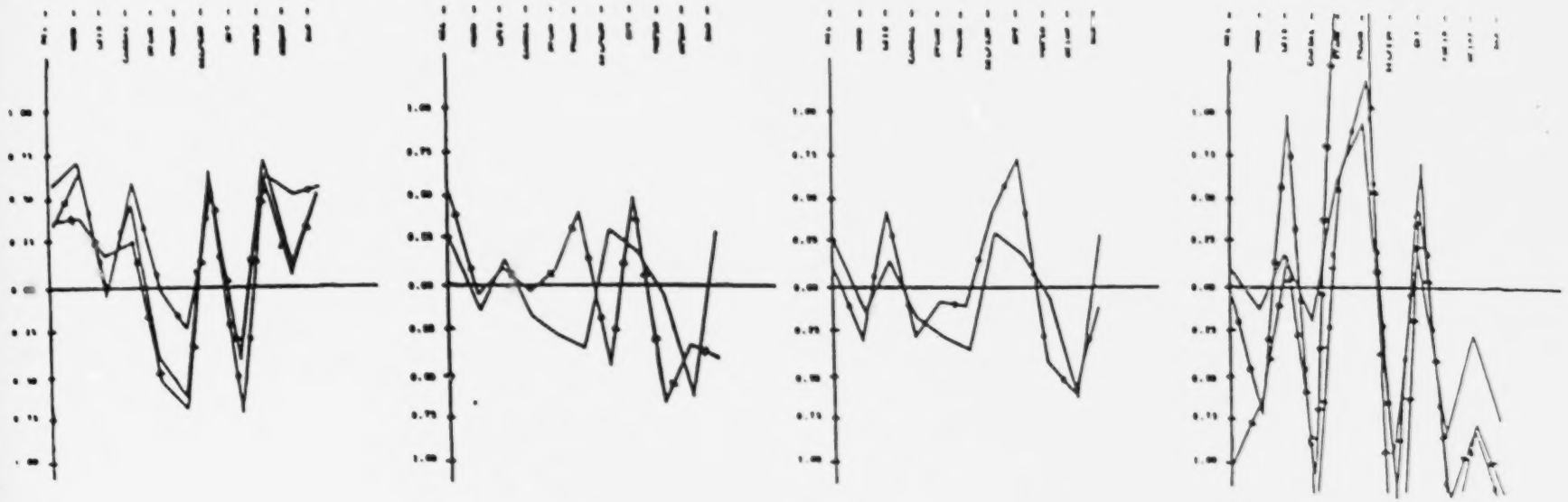
Table 1

Description of Clusters for the Total Group

Cluster	High scores (standard score of .4 and higher)	Intermediate scores (standard score between .4 and -.4)	Low scores (standard score of -.4 and lower)
1	Relationship, Work, Career Salience, Self-esteem, Vocational Identity, Barriers	Leisure, Occupational Information	State Anxiety, Trait Anxiety, Externality
2		Relationship, Work, Leisure, Career Salience, State Anxiety, Trait Anxiety, Self-Esteem, Externality, Vocational Identity, Barriers	Occupational Information
3	Work, Career Salience, Self-Esteem, Vocational Identity, Occupational Information, Barriers	State Anxiety, Trait Anxiety	Relationship, Leasure, Externality
4	State Anxiety, Trait Anxiety	Relationship, Work, Leisure, Career Salience, Externality, Occupational Information	Self-Esteem, Vocational Identity, Barriers
5	Externality, Occupational Information	Leisure, State Anxiety, Trait Anxiety, Self-Esteem, Vocational Identity, Barriers	Relationship, Work, Career Salience

Figure 1

Convergence of the Total Sample and Subsamples for Clusters 1, 2 and 4



Cluster 1 Cluster 2 Cluster 4

Total Sample Subsample 1 Subsample 2

(REL = Relationship Orientation, WORK = Work Orientation, LEIS = Leisure Orientation, CARSAL = Career Salience, STANX = State Anxiety, TRANX = Trait Anxiety, SELFEST = Self-Esteem, EXT = Externality of Locus of Control, VOCID = Vocational Identity, OCINF = Possession of Occupational Information, BAR = Absence of Barriers to Decision Making and Implementation.)